

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2020 ANNUAL REPORT

PROJECT: 98b

**Project Title**

Upper Yampa River northern pike management and monitoring

**Bureau of Reclamation Agreement Number:**

R20PG00024

**Project/Grant Period:**

Start date: 10/01/2019

End date: 09/30/2024

Reporting period end date: 9/30/2020

Is this the final report? Yes \_\_\_ No X

**Principal Investigator:**

Christian Smith, Fish Biologist

U.S. Fish and Wildlife Service

Green River Basin Fish and Wildlife Conservation Office

1380 S. 2350 W.

Vernal, UT 84078

Phone: (435) 789-0351 ext. 21

Fax: (435) 789-4805

Email: [christian t smith@fws.gov](mailto:christian_t_smith@fws.gov)

**Abstract:**

This project aims to reduce the abundance of nonnative fishes immediately upstream of endangered fish critical habitat in the Yampa River between Hayden and Craig, Colorado. In most years, electrofishing boats are used to sample this reach during spring and early summer. However, in 2020 all spring fieldwork was cancelled because of COVID 19 concerns. The Yampa River smallmouth bass Surge was deemed mission critical, and field work associated with it was given an exception and allowed to continue. Nonnative removal work began on 23 June, and occurred within the lower twenty miles of the reach where smallmouth bass densities have historically been high. Smallmouth bass captured during Surge passes are reported in the Project 125 Annual Report (Hawkins 2020, in prep.), however northern pike and white sucker are reported herein. A total of 61 northern pike and 510 white sucker were caught over the course of seven days in 2020.

Study Schedule: 2004-Ongoing

**Relationship to RIPRAP:**

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

III.B.2 Control nonnative fishes via mechanical removal

III.B.2.a. Estimate nonnative status, trends, and distribution

III.B.2.d. Remove northern pike from Yampa River

III.B.2.e. Remove smallmouth bass

**Accomplishment of FY 2020 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:**

Targeted northern pike removal in the Yampa River typically occurs in April and May. Concerns related to the spread of COVID 19 in early 2020 prompted the cancellation of all spring non-essential fieldwork, which included this project. During late May, the U.S. Fish and Wildlife Service Regional Director cautiously allowed fieldwork to resume in a limited capacity. Between 23 June and 10 July, a total of three electrofishing passes were conducted, and all were part of the Yampa River smallmouth bass Surge (The Surge). The Surge is a component of Project 125 (Colorado State University Larval Fish Lab [LFL]), wherein multiple agencies simultaneously conduct smallmouth bass removal throughout the Yampa River downstream of Hayden, Colorado. In contrast to typical Project 98b April and May removal which occurs primarily in backwater habitat, effort during The Surge is focused on main channel shoreline habitat. These passes excluded the Hayden pump house (RM 171) to Yampa River State Park (YRSP; RM 158.5) reach because smallmouth bass have been relatively sparse upstream of YRSP to date. Smallmouth bass captured during Surge passes are reported in the Project 125 Annual Report (Hawkins 2020, in prep.), however northern pike and white sucker are reported herein.

Northern Pike

We removed 61 northern pike from the study reach in 2020. We consider fish <300mm total length (TL) juveniles, fish >300mm TL adults, and fish >450mm TL as piscivores. Of the 61 fish removed in 2020, 25 were juveniles and 36 were adults, of which 16 were piscivores (Table 1).

Length-frequency of pike captured in 2020 was somewhat evenly distributed, although fish measuring between 151 – 200 mm TL were most common (Figure 1). Otolith examination by LFL researchers suggests that these pike were spawned in spring 2020 (John Hawkins, personal communication) when northern pike removal was not being conducted. However, the presence of young-of-year fish is not unusual for northern pike caught during The Surge (Figure 2); during most years adults comprise a large majority of our pike captures and are more frequently caught during April and May. Nevertheless, the majority (59%) of fish captured in 2020 were adults, ranging from 318-835 mm TL.

Because of changes in removal effort seen in 2020, inter-annual comparisons with data from 2020 should be viewed with caution and only applied to prior years' Surge efforts. The annual catch rate during the 2020 Surge passes (1.5 NP/hr; Figure 3) was lower than Surge passes in 2019 (CPUE = 4.1 NP/hr). Unlike past years when catch rates typically peaked during the first pass, northern pike catch rates in 2020 were highest during the third pass (9 – 10 July, CPUE = 2.7 NP/hr.; Figure 4) as were the number of pike removed (n = 26; Figure 5).

More northern pike (n = 20) were caught in the two-mile reach that encompasses the Elkhead Creek confluence (RM 149 – RM 147; Figure 6) than any other, and the majority (n = 17) were caught within this notorious tributary.

A total of 84 northern pike were marked with Floy tags in April 2019. Subsequent removal efforts in 2019 yielded 12 of these marked fish (Smith 2019). The resulting mark-recapture abundance estimate reported that northern pike abundance was lower within the Project 98b study reach in 2019 than in previous (2004 – 2010) abundance estimates (Bestgen et al. 2020). This analysis supported observations drawn from declining northern pike catch rates in the study reach in recent years, particularly since

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

CPW began removing pike with gill nets in 2014. Based on the success of this effort in calculating northern pike abundance decline, this effort could be repeated on a cycle to determine long-term trends in pike abundance.

### White sucker and other species

We removed 510 white sucker (58-496 mm TL) in 2020 compared to 2,442 white sucker (20-558 mm TL) in 2019. As with northern pike, the RM 149 – RM 147 reach yielded the most white sucker (n = 97) of any two-mile reach (Figure 6). The first pass yielded the most white sucker captures (Figure 7) and the highest white sucker catch rate was produced in the second pass (Figure 8).

In addition to northern pike and white sucker, 25 creek chub and 35 green sunfish were removed from the study reach this year.

### Shortcomings

Public health concerns related to the COVID 19 pandemic resulted in the cancellation of all April and May fieldwork in 2020. Spring has long been recognized as the preferred northern pike removal season because we are able to identify and access discrete spawning habitat (i.e. backwaters). Additionally, removal of adult pike before the spawning period inherently reduces reproductive success. Since we were not able to conduct spring removal this year, we removed fewer northern pike in 2020 than in any year since 2005.

Concerns regarding future access to the “151” backwater, particularly for gill netting efforts, prompted us to not consider removal in this backwater in 2020 because of the landowner’s distaste for electrofishing. Given the decline in the number of pike captured and catch rates that we have observed while electrofishing this backwater in recent years, especially when compared to the higher catch rates produced by gill netting, we felt it was better left alone.

### **Additional noteworthy observations:**

A PIT-tagged bluehead sucker was captured on 24 June near the Elkhead Creek confluence. Investigation of this individual’s encounter history in the STReAMS database revealed that it had been stocked by Colorado Parks and Wildlife near Steamboat Springs in October 2019. Between October stocking and June capture, this fish had grown 21 mm TL and traveled at least 45 river miles.

The Yampa River broke through its bank near the Yampa Valley Golf Course during the peak flow period in late June 2019. It flooded multiple gravel pits, and abandoned approximately one mile of the previous river channel. Shortly thereafter, the Recovery Program and its partners relayed their concerns regarding the prime northern pike and smallmouth bass habitat created by this bank avulsion to the gravel mining operation. Fortunately and commendably, the gravel mining operation quickly addressed these and other concerns by filling the bank avulsion prior to the 2020 runoff season.

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

### **Recommendations:**

We recommend conducting five passes as early as possible in the spring to remove as many northern pike as possible in backwaters where spawning individuals are concentrated. Two passes were eliminated from this project due to budget reductions in 2020. Since only three smallmouth bass were caught in Project 98b in 2019 and bass removal in this reach occurs during The Surge, prioritization should be placed on removing northern pike in the early season.

If deemed necessary, gill netting efforts could be extended later into the spring and into more backwaters by shifting some effort from electrofishing to gill netting. In some cases this will require us to obtain permission from landowners to access backwaters that exist within private property. Crews in electrofishing boats could identify near and off-channel backwaters that are not accessible to Jon boats due to constrictions or breach depths at certain flows. We believe that this would increase our efficiency at low and high water levels.

### **Project Status:**

On track and ongoing.

### **FY 2020 Budget Status**

Funds Provided: \$109,731

Funds Expended: \$51,843

Difference: \$57,888

Percent of the FY 2020 work completed, and projected costs to complete: 10%

Recovery Program funds spent for publication charges: -X-

### **Status of Data Submission**

(Where applicable): Data will be uploaded in the STReAMS database in December 2020.

### **Signed:**

Chris Smith  
Principal Investigator  
14 December, 2020

### **References**

Bestgen, K. R., K. A. Zelasko, T. Eyre, C. Smith, G. C. White, and M. T. Jones. 2020. 51 Abundance estimation verifies declining trends of northern pike in the Yampa River, Colorado. 52 Final report to the Upper Colorado River Endangered Fish Recovery Program. Denver Federal 53 Center, Lakewood, Colorado. Department of Fish, Wildlife, and Conservation Biology, 54 Colorado State University, Fort Collins. Larval Fish Laboratory Contribution 218.

Smith, C. 2019. Upper Yampa River northern pike management and monitoring. Annual Report to the Upper Colorado River Endangered Fish Recovery Program. Denver, CO

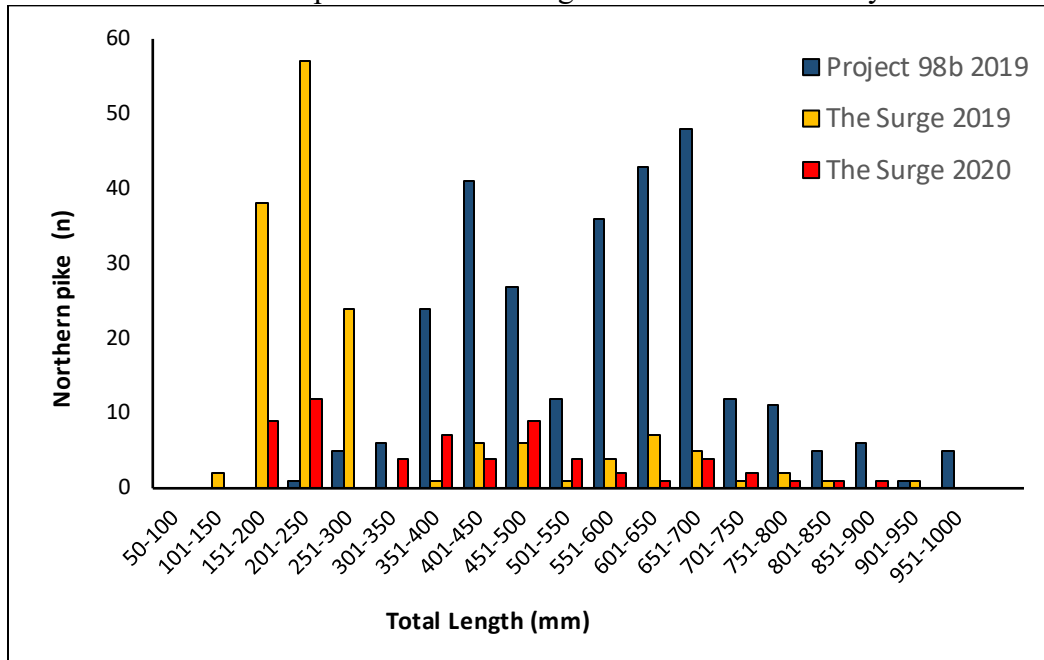
UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

Table 1. Juvenile (includes all northern pike < 300 mm), adult (300 ≤ 449 mm), and piscivore (≤450 mm) class northern pike captured in the Yampa River for each pass in 2020. Dates sampled are indicated for each pass. Pass one occurred from Yampa River State Park (RM 158.5) to South Beach (RM 134.5) and subsequent passes occurred from the Dorsey boat ramp (RM 151.5) to South Beach. All passes were conducted in conjunction with Project 125 (The Surge).

Pass/Date	Juveniles	Adults	Piscivores	Total
Surge 1: 23-25 June	4	7	12	23
Surge 2: 7-8 July	8	3	1	12
Surge 3: 9-10 July	13	10	3	26
Total	25	20	16	61

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

Figure 1. Length frequency of northern pike captured in the Project 98b reach in 2020 (red bars). Length frequency from Project 98b (blue bars) and The Surge in 2019 allows comparison between size distribution of northern pike removed during different seasons and years.



## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

Figure 2. Number of northern pike removed annually from 2005 – 2020 in the Yampa River between Hayden and Craig, Colorado. The proportion of northern pike caught from 2017 to 2020 as part of Project 98b (passes 1 – 6) are shown in dark blue and The Surge/Project 125 passes are displayed in light blue. Accordingly, in 2020 all northern pike were caught during The Surge.

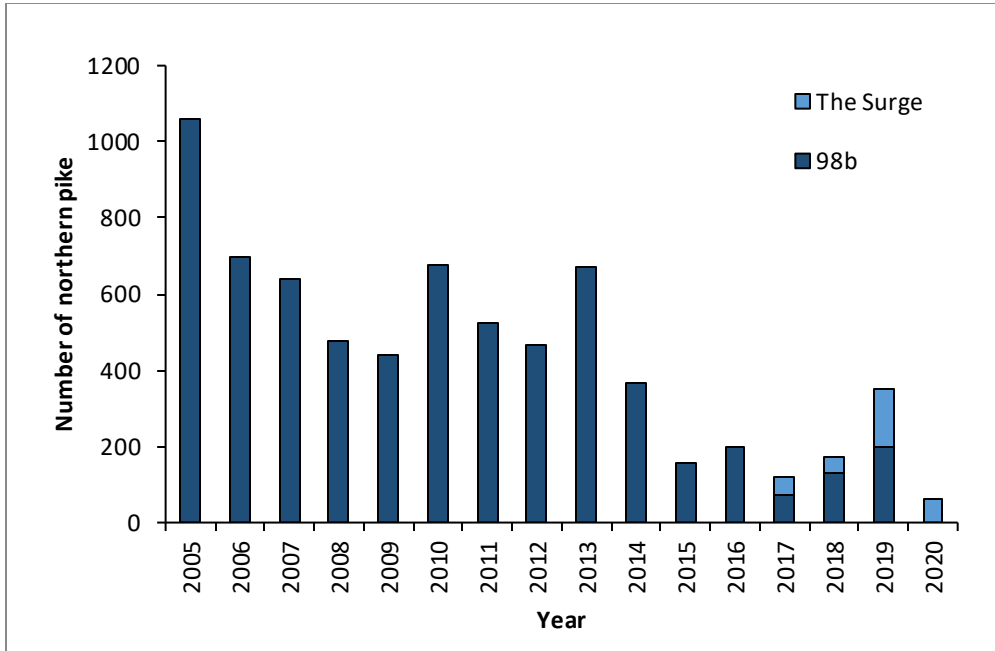
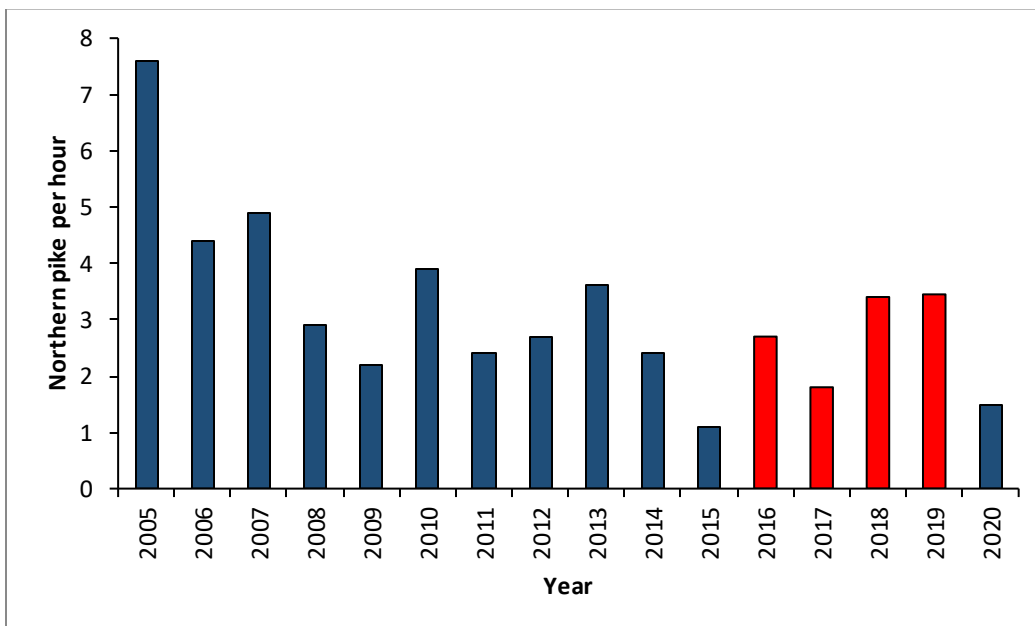


Figure 3. Overall northern pike catch rates per hour (CPUE) from 2005 - 2020 from the Project 98b study reach. Changes to northern pike removal and data collection methodology were employed beginning in 2016 (red bars) wherein effort was expended and recorded primarily in backwaters. This resulted in catch rates that were biased higher from 2016 through 2019. All northern pike removal occurred during The Surge in 2020, and since few backwaters were connected to the Yampa River, our data collection was more akin to 2005-2015.



UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

Figure 4. Catch rates for northern pike by pass in Project 98b study reach in 2020. All passes were conducted as part of The Surge/Project 125.

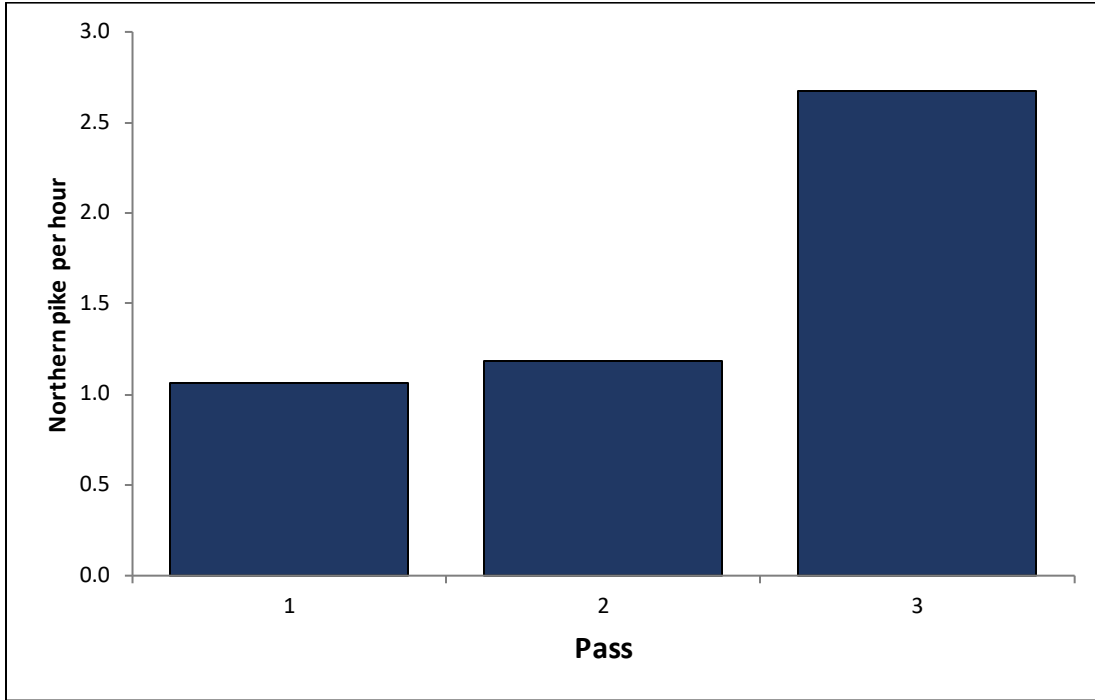
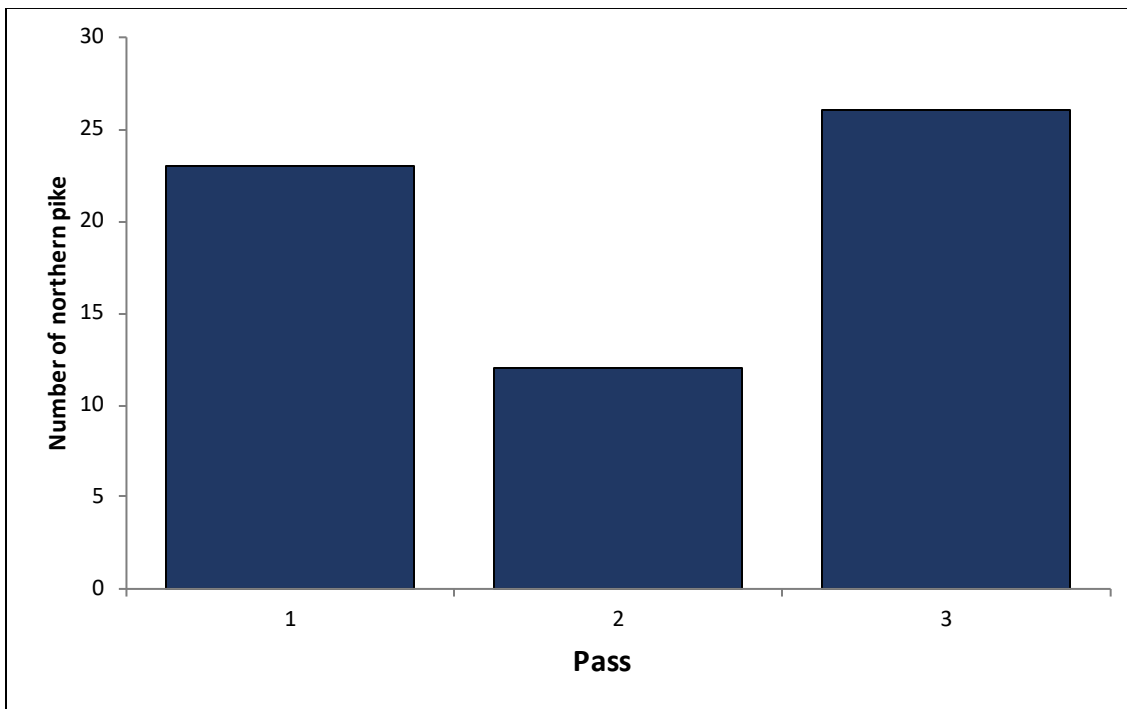


Figure 5. Northern pike (n) captured by pass in the Yampa River in the Project 98b study reach in 2020. All passes were conducted as part of The Surge/Project 125.





# UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

Figure 6. Total number of northern pike and white sucker captured in two-river mile reaches, Yampa River 2020 in the Project 98b study reach.

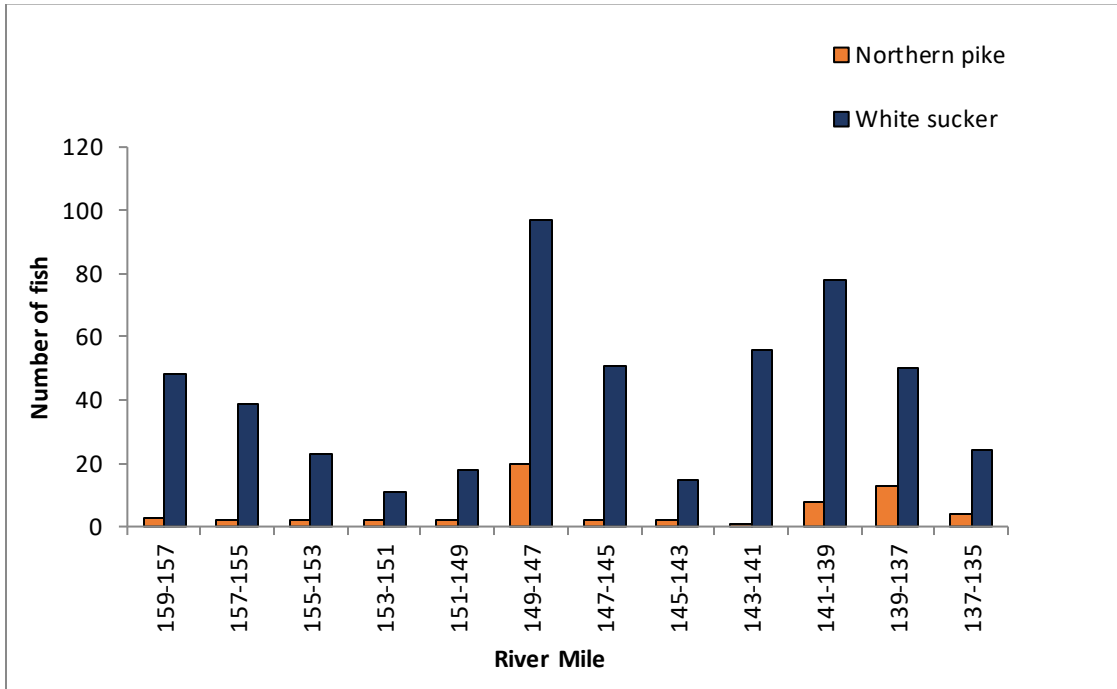
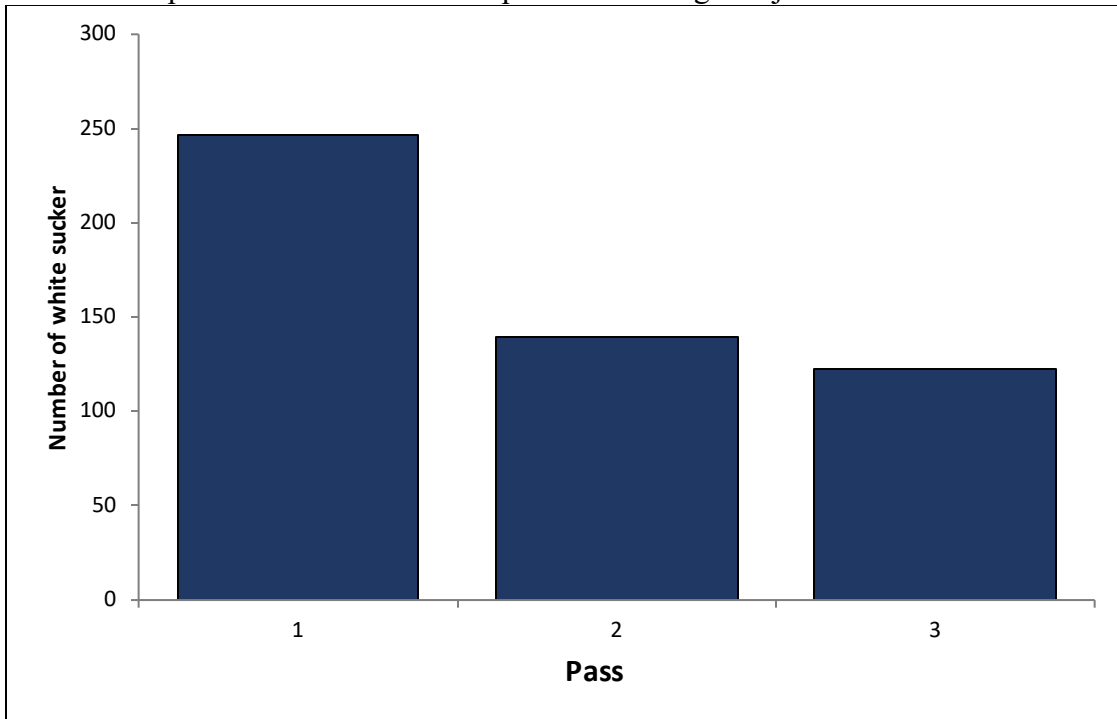


Figure 7. Number of white suckers removed by pass from the Project 98b study reach in 2020. All passes were conducted as part of The Surge/Project 125.



UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

Figure 8. White sucker catch rates by pass in the Project 98b study reach, 2020. All passes were conducted in conjunction with The Surge/Project 125.

